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Author(s): Coid, Jeremy; Yang, Min; Ullrich, Simone; Roberts, Amanda; Moran, Paul; Bebbington, Paul; Brugha, Traolach; Jenkins, Rachel; Farrell, Michael; Lewis, Glyn; Singleton, Nicola; Hare, Robert.

Article title: Psychopathy among prisoners in England and Wales

Year of publication: 2009

Citation: Coid, J. et al. (2009) 'Psychopathy among prisoners in England and Wales' *International Journal of Law and Psychiatry* 32 (3) 134-141

Link to published version: <http://dx.doi.org/10.1016/j.ijlp.2009.02.008>

DOI: 10.1016/j.ijlp.2009.02.008

Word Count: 4,974

Abstract: 200

Psychopathy among Prisoners in England and Wales

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Funding support: Department of Health, England and Wales

Abstract

Most research into psychopathy among prisoners is based on selected samples. It remains unclear whether prevalences are lower among European populations. This study aimed to measure the prevalence of psychopathy, and the distribution and correlates of psychopathic traits in a representative national sample of prisoners. Psychopathy was measured using the revised Psychopathy Checklist (PCL-R) in a second stage, cross-sectional survey of prisoners in England and Wales in 1997 (n=496). Poisson regression analysis was carried out to examine independent associations between correlates and PCL-R total and factor scores. The prevalence of categorically diagnosed psychopathy at a cut off of 30 was 7.7% (95%CI 5.2-10.9) in men and 1.9% (95%CI 0.2-6.9) in women. Psychopathic traits were less prevalent among women. They were correlated with younger age, repeated imprisonment, detention in higher security, disciplinary infractions, antisocial, narcissistic, histrionic, and schizoid personality disorders, and substance misuse, but not neurotic disorders or schizophrenia. The study concluded that psychopathy and psychopathic traits are prevalent among male prisoners in England and Wales but lower than in most previous studies using selected samples. However, most correlates with psychopathic traits were similar to other studies. Psychopathy identifies the extreme of a spectrum of social and behavioral problems among prisoners.

1. Introduction

Psychopathy is a personality disorder associated with multiple social and behavioral problems (Cornell et al., 1996; Hill, Neumann, & Rogers, 2004) and has an exceptionally poor prognosis among the mental disorders (Andersen, Sestoft, Lillebaek, Mortensen, & Kramp, 1999; Hare, 2003). Although not currently included as a separate diagnostic category in the ICD or DSM classifications, interest in psychopathy has grown and its measurement has become increasingly important in risk assessment. It is a rare condition affecting less than 1% of the household population (Coid, Yang, Ullrich, Roberts, & Hare, submitted) but highly prevalent among prisoners and associated with homelessness and psychiatric hospitalization over the lifespan. However, there are remarkable differences in reported prevalence rates of psychopathy among samples of prisoners in different countries within a range of 3% to 73%, (Cooke, 1996; Coid, 1998; Moran, 1999; Hare, 2003; Ullrich, Paelecke, Kahle, & Marneros, 2003; Assadi et al., 2006).

Psychopathy, measured using the Psychopathy Checklist – Revised (PCL-R; Hare, 2003), incorporates aspects of antisocial behavior as well as core personality traits. Studies of the factor structure of psychopathy indicate the importance of different subcomponents (Cooke & Michie, 2001). They are now incorporated into a “four-factor” model based on confirmatory factor analyses (Hare & Neumann, 2006; Neumann, Vitacco, Hare, & Wupperman, 2005; Vitacco, Neumann, & Jackson, 2005), although initially referred to as “two factor - four facet model” in the second edition of the PCL-R (Hare, 2003). This model allows for finer descriptive analysis of individuals encountered in clinical practice and facilitates empirical study of the subcomponents of psychopathy (see Figure 1). The components of psychopathy comprise “deceitful interpersonal style”, “affective deficiency”, “impulsiveness” or “lifestyle” (depending on the assumption of three or four underlying factors) and the “antisocial” component. This differentiation of psychopathy now includes possibly differing etiological factors (Blonigen, Hicks, Krueger, Patrick & Lacono, 2005;

Viding, Blair, Moffitt & Plomin, 2005), with evidence of differing neuro-cognitive dysfunction associated with certain subcomponents (Hare, 2003; Blair, Mitchel, & Blair, 2005). However, research into psychopathy has almost exclusively focused on non-representative samples (including samples “of convenience”) using primarily North American male prisoners selected from high and medium secure institutions (Hare, 2003). Psychopathic individuals are likely to be concentrated in these locations due to serious criminal behavior and behavioral disorder whilst incarcerated (Coid, 1998) and the generalisability of findings from these studies is unclear. In contrast, a representative sample of Scottish prisoners (Cooke, 1994) combined with selected samples of English offenders (Hare, 2003, pp. 205-210; Hare, Clark, Grann & Thornton, 2000) demonstrated lower PCL-R scores than North American samples. Based on Item Response Theory analyses (IRT), it was subsequently argued that, when making the diagnosis, the standard PCL-R cut score for psychopathy should be lowered for UK populations (Cooke & Michie, 1999; Cooke, Michie, Hart & Clark, 2005). However, Bolt, Hare, & Neumann (2007), also using IRT analyses but with a different anchor item selection method, have proposed that the recommended PCL-R cut-off score of 30 reflects approximately the same level of psychopathy in the UK as in North America. According to their analyses, lower scores in one country do not necessarily mean lack of scalar equivalence, implying that the cut score for determining prevalence should be similar in the UK and North America.

Factor 1 (Interpersonal)	Factor 2 (Affective)	Factor 3 (Lifestyle)	Factor 4 (Antisocial)
1. Glibness/superficial charm	6. Lack of remorse or guilt	3. Need for stimulation/ prone to boredom	10. Poor behavioral controls
2. Grandiose sense of self-worth	7. Shallow affect	9. Parasitic lifestyle	12. Early behavioral problems
4. Pathological lying	8. Callous/lack of empathy	13. Lack of realistic long-term goals	18. Juvenile delinquency
5. Cunning/manipulative	16. Failure to accept responsibility for own actions	14. Impulsivity	19. Revocation of conditional release
		15. Irresponsibility	20. Criminal versatility

Fig 1. Items in the 4-factor model of psychopathy (Hare, 2003)

(Items 11. Promiscuous sexual behavior and 17. Many short term marital relationships omitted from the model)

Our aim was to determine whether certain correlates of psychopathy observed in non-representative samples are found equally in a more representative sample of an entire correctional jurisdiction. We therefore estimated the prevalence of psychopathy using a cut-off score of 30, examined the distribution of psychopathic traits, and elucidated the correlates of total and factor scores of psychopathy among a representative sample of the prisoner population in England and Wales, aged 16-64, assessed in 1997. We used the PCL-R to examine the relationship between measures of psychopathy and demography, verbal intelligence, DSM-IV Axis II personality disorder traits, ICD-10 clinical syndromes, offending behavior, and behavioral problems in the prison setting. We aimed to investigate the overall and gender specific prevalence of categorically diagnosed psychopathy in a representative sample of prisoners. Furthermore, we were interested in the differential associations of the factors of psychopathy with the above mentioned outcome variables. The conceptualization of psychopathy as three or four factor model is a recent development. Consequently, few studies have investigated whether the components demonstrate similar or different correlations, and which may be highly relevant for future understanding of psychopathy. However, as the position regarding

the cut-off in a European population, together with the ongoing debate as to whether a three- or four- factor solution best fit data on psychopathy remains unresolved, we adhered to the recommended manual cut-off of 30 and examined the four-factor model of psychopathy.

2. Method

2.1. Sample

The sample comprised 496 participants in the second of a two-stage survey of psychiatric morbidity among prisoners in England and Wales, aged 16-64 years, carried out by the Office for National Statistics in 1997 (Singleton, Meltzer, Gatward, Coid & Deasy, 1998). All 131 penal establishments were included, then containing 61,944 prisoners, including 46,872 male sentenced, 12,302 male remand, and 2,770 women prisoners. Different sampling fractions were applied to assure the requisite number of interviews for each group of prisoners. This included 1 in 34 male sentenced prisoners, 1 in 8 male remand prisoners, and 1 in 3 women prisoners, either remand or sentenced. In the last four weeks of the survey, the sampling fraction changed to 1 in 50 male sentenced, as a larger number of this group had been interviewed. Samples were taken from all prison locations in the first phase to avoid over- or under-sampling those with mental health problems in locations such as Health Care and to be representative of the entire national prison estate. The survey therefore included all prisons (115 male, 11 women, 5 mixed). This included a sample of 16.2% from Young Offender Institutions, 10.3% from open prisons or lowest security category D, 5.1% closed prisons, 7.4% category B, 25% category C, 31.6% local prisons including sentenced and remanded by local courts, and 5.9% from dispersal prisons, the highest on the security scale. Substitution of prisoners no longer available for interview, including those transferred or released, with new prisoners was performed for those on remand.

In the first stage, 3,563 prisoners were selected, of whom 3,142 (88%) completed full interviews. 37 failed to complete a full interview, 198 (6%) refused, and 53 (1%) could not take part, mainly due to language problems. Interviewers could not contact 118 (3%), and were advised not to interview 15.

In the second stage, 661 prisoners, a 1 in 5 random subsample, were then selected for clinical interview, of whom 505 (76%) were interviewed, 105 (16%) could no longer be contacted, and 50 (8%) refused.

2.2. Diagnostic measures

Self-report measures were taken in the first stage using laptop computers: the Clinical Interview Schedule (CIS-R; Lewis & Pelosi, 1990) measures six ICD-10 syndromes in the week preceding interview, including mixed anxiety and depressive disorder, generalized anxiety disorder, depressive episodes, phobias, obsessive-compulsive disorder, panic disorder; and a brief measure of perceptual-verbal intelligence, the Quick Test (Ammons & Ammons, 1962). We also analyzed a combined category of the ICD conditions. Additional self-report measures included socio-demography and behavior in the prison setting. Information on criminal convictions was obtained from prison records.

Psychopathy was measured in the second phase using the Psychopathy Checklist – Revised (PCL-R; Hare, 1991, 2003) consisting of 20 items scored 0, 1, or 2 based upon clinical interview and review of file information. This was administered after first completing the Schedules for Clinical Assessment in Neuropsychiatry (SCAN; Wing et al, 1990; World Health Organisation, 1999) for ICD-10 clinical syndromes, and the Structured Clinical Interview for Axis II disorders (SCID-II; First, Gibbon, Spitzer & Williams, 1997) measuring categories of DSM-IV personality disorder. The scoring of the PCL-R allowed us to present our results using continuous scores as well as

categorical measures, including the recommended score of 30 as the cut score, above which a diagnosis of psychopathy is attributed.

The second stage of the survey was conducted by six psychiatrists at specialist registrar level and two clinical psychologists trained in a group to use the PCL-R assessment procedure and scoring. This involved the viewing of videotapes of assessment interviews to establish norms for scoring individual items. Cronbach's Alpha coefficients of total, male, and female PCL-R scores were within the acceptable range (total 0.89, male = 0.88, female = 0.90) suggesting good internal consistency. Inter-item correlations ($M=0.29$, $SD=0.13$, $Md=0.29$) also indicated satisfactory homogeneity.

2.3. Statistical analysis

For PCL-R total and four factor scores, descriptive analyses of demographic characteristics and social adversity measures were derived using SPSS (v12). Pearson's correlation coefficients were calculated for inter-item correlations, and Cronbach's alpha coefficients for overall internal consistency among the 20 items of PCL-R. Partial correlation analysis was performed for the four factors of psychopathy, controlling for gender. Poisson regression analysis was applied to investigate the association between the PCL-R total scores and demographic characteristics of respondents, Axis II disorders, intelligence, SCAN diagnosis, CIS-R neurotic syndromes, index offences, adult behavior problems and life events experienced by respondents. These were adjusted for confounders or co-morbid disorders, applicable to each variable of interest. As the four factors are strongly associated with each other, the analysis took into account their inter-correlations when investigating associations between the variables of interest and factors scores. We used multivariate Poisson regression analysis, which treats the four factors scores as repeated measures within each respondent. The full variance-covariance structure of the four factor scores was then captured by the model. The effect of each variable on the PCL-R scores was tested by the standard Z-score statistic.

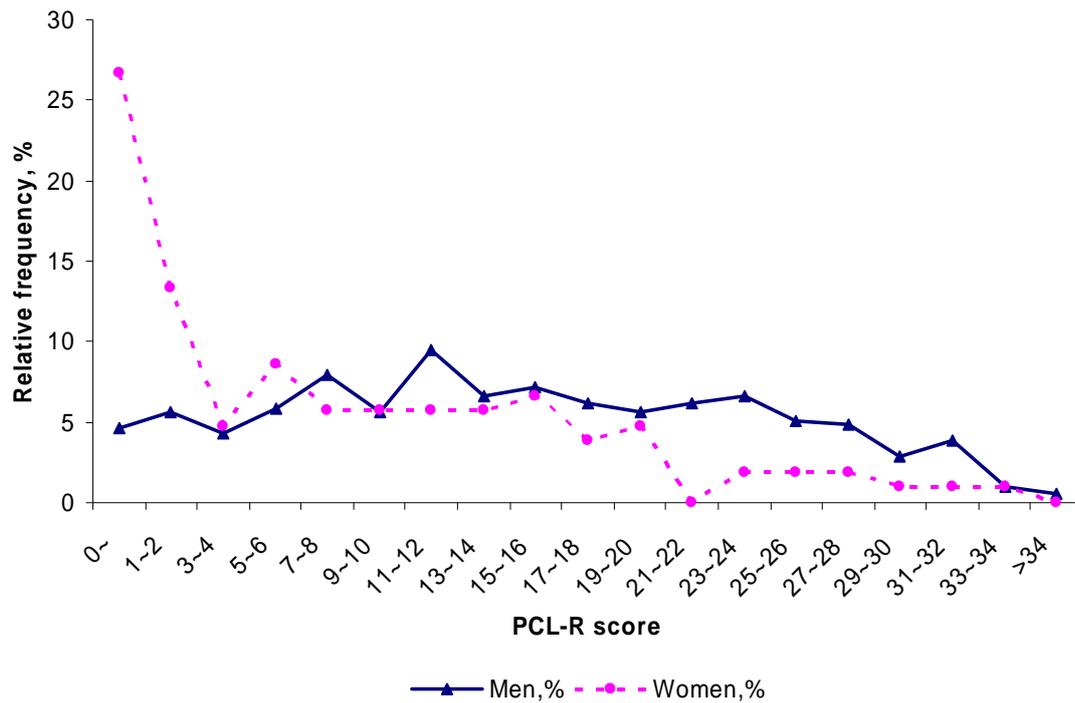
All regression analyses were performed in MLwiN (V2.0). Extra Poisson variation was allowed in the Poisson regression model to reflect the excessive variation of the PCL-R scores due to extreme values.

3. Results

3.1. Prevalence

The prevalence of psychopathy using a PCL-R cut-off of 30 was 7.7% (95% CI: 5.2-10.9) in men and 1.9% (0.2-6.9) in women. Remanded men had a higher prevalence (9.4%, 5.5-15.0) than sentenced men (6.2%, 3.3-10.6). Sentenced women demonstrated the same prevalence as the entire sample of sentenced and remanded women prisoners (1.9%, 0.2-8.1). The gender ratio for psychopathy at this cut score was 4:1. Mean total PCL-R scores were 15.03 (SD 9.14) for men and 8.31 (SD 8.59) for women.

Figure 2 shows the distribution of PCL-R total scores among men and women in the prison population. A relatively larger proportion of women had none, or very few psychopathic traits (44.8% scored less than 5).

Figure 2. Prevalence of psychopathy

3.2. Demography, intelligence and prison location

Partial correlation coefficients between the four factors, controlling for gender, demonstrated that all were significantly correlated (Table 1). The strongest correlations were between the antisocial (F4) and lifestyle (F3) factors.

Table 1. Inter-factor correlation

	Pearson's simple correlation			Partial correlation (adjusted for gender)		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
Factor 2	0.44***			0.42***		
Factor 3	0.55***	0.54***		0.52***	0.48***	
Factor 4	0.47***	0.48***	0.73***	0.43***	0.44***	0.75***

*** $p < 0.0001$ (two tailed)

Lower mean PCL-R total scores were observed among prisoners aged 35-64 compared to those 16-34 years, accounted for by the affective, lifestyle, and antisocial, but not interpersonal, factors (Table 2). Men scored significantly higher than women for total scores and all factors. Non-UK born prisoners demonstrated lower total, lifestyle, and antisocial scores. However, black prisoners scored higher on interpersonal and lifestyle factors.

Single and unmarried cohabiting prisoners had significantly higher total and antisocial factor scores. Married/widowed prisoners had lower lifestyle scores. Educational qualifications were associated with lower total, affective, lifestyle, and antisocial scores. However, there were no associations between social class and total PCL-R scores. Prisoners from social classes I and II scored higher than those from III to VI, and those unemployed before imprisonment. Unemployed individuals scored higher on the lifestyle factor.

There was no association between prisoner status (remanded or sentenced) and psychopathy scores after controlling for other demographic variables.

Regression analyses of verbal intelligence and PCL-R scores (after controlling for gender and factor inter-correlations) demonstrated negative associations with total scores [β (SE)=-0.012 (0.005), $p<0.05$], lifestyle scores [β (SE)=-0.011 (0.005), $p<0.05$], and antisocial scores [β (SE)=-0.013 (0.006), $p<0.05$]. There were no significant correlations with factors 1 and 2.

Prisoners housed in open prisons had the lowest mean PCL-R scores (Table 3). Total scores were significantly higher in local and dispersal and other closed locations, but not Young Offenders institutions. This was accounted for by factors 3 and 4, but not factors 1 and 2.

Table 2. Sociodemographic and socioeconomic characteristics of the total sample (n=496)

Coid et al, 2006

Demographic characteristic	Category group	Respondents	Total	Factor 1	Factor 2	Factor 3	Factor 4
				<i>Interpersonal</i>	<i>Affective</i>	<i>Lifestyle</i>	<i>Antisocial</i>
		N (%)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Age group	16-34	379 (76.4)	15.30 (9.20)	1.84 (2.02)	2.62 (2.50)	4.92 (3.03)	4.46 (3.23)
	35-54	109 (22.0)	8.71 (7.98)**	1.34 (2.00)	1.56 (2.05)*	2.44 (2.49)**	2.35 (2.80)**
	55-74	8 (1.6)	1.50 (2.50)**	0.00 (0.00)	1.13 (2.23)	0.13 (0.35)*	0.00 (0.00)
Gender	Male	391 (78.8)	15.00 (9.14)	1.82 (2.07)	2.65 (2.44)	4.67 (3.02)	4.41 (3.23)
	Female	105 (21.2)	8.31 (8.59)***	1.27 (1.74)*	1.29 (2.16)***	2.93 (3.09)**	2.12 (2.74)***
Non-UK born	UK born	442 (89.1)	14.20 (9.37)	1.74 (2.04)	2.47 (2.46)	4.48 (3.07)	4.17 (3.28)
	Non UK born	54 (10.9)	8.57 (8.40)*	1.35 (1.80)	1.44 (2.15)	2.80 (3.05)*	1.94 (2.37)***
Ethnic origin	White	412 (83.1)	14.10 (9.23)	1.65 (1.99)	2.49 (2.46)	4.52 (3.06)	4.14 (3.23)
	Black	59 (11.9)	11.50 (10.6)	2.15 (2.34)**	1.86 (2.37)	3.29 (3.12)*	2.97 (3.47)
	Asian	10 (2.0)	8.90 (7.45)	1.00 (0.94)	1.60 (2.27)	3.20 (3.71)	2.30 (1.89)
	Others	15 (3.0)	10.60 (9.48)	1.80 (1.70)	1.33 (2.13)	3.00 (3.16)	2.80 (3.36)
Marital status before	Single	177 (35.7)	15.20 (9.23)	1.85 (2.00)	2.62 (2.54)	4.77 (3.02)	4.55 (3.18)

prison	Divorced/separated	49 (9.9)	7.98 (6.06)*	1.16 (1.25)	1.45 (1.88)	2.59 (2.49)	1.76 (2.24)**
	Married/widowed	72 (14.5)	8.57 (9.34)*	1.26 (1.98)	1.69 (2.21)	2.43 (3.16)*	2.28 (2.85)*
	Cohabiting	198 (39.9)	15.40 (9.18)	1.86 (2.16)	2.60 (2.48)	4.98 (2.90)	4.49 (3.29)
Education qualification	None	215 (43.3)	15.21 (9.43)	1.73 (2.01)	2.77 (2.63)	4.83 (3.05)	4.49 (3.25)
	Any	281 (56.7)	12.37 (9.26)**	1.68 (2.03)	2.05 (2.25)*	3.89 (3.11)*	3.49 (3.23)*
Social class	I&II	52 (10.5)	10.19 (9.07)	2.27 (2.61)	1.73 (2.20)	2.69 (2.77)	2.48 (3.01)
	IIINM	48 (9.7)	10.73 (9.71)	1.73 (2.10)*	1.83 (2.44)	3.50 (3.22)	2.44 (2.74)
	IIIM	136 (27.4)	12.81 (8.95)	1.35 (1.79)***	2.35 (2.50)	4.13 (3.15)	3.66 (3.16)
	IV	133 (26.8)	13.67 (9.61)	1.71 (2.02)**	2.21 (2.19)	4.28 (3.06)	4.11 (3.34)
	V&VI	64 (12.9)	15.56 (9.24)	1.70 (1.91)**	2.48 (2.49)	4.86 (2.93)	5.09 (3.32)
Remanded	Missing label	63 (12.7)	18.20 (8.37)	1.95 (1.88)*	3.51 (2.69)	6.08 (2.61)*	5.24 (2.92)
	No	299 (60.3)	12.05 (9.32)	1.56 (2.07)	2.07 (2.36)	3.85 (3.11)	3.38 (3.15)
	Yes	197 (39.7)	15.96 (9.12)	1.91 (1.91)	2.81 (2.52)	4.98 (3.01)	4.75 (3.28)

When comparing the mean scores between the category levels within each variable, other demographic variables and inter-factor correlations are adjusted for. The group 'missing label' in social class consists of mostly young men, white, no qualification, single or cohabiting with antisocial personality disorder.

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 3. Association between PCL-R scores and prison location

Prison Location	n (%)	PCL-R				
		Total	Factor 1	Factor 2	Factor 3	Factor 4
			<i>Interpersonal</i>	<i>Affective</i>	<i>Lifestyle</i>	<i>Antisocial</i>
Open (reference)	42 (8.5)	6.3 (7.6)	0.8 (1.5)	1.7 (2.1)	1.9 (2.5)	1.5 (2.3)
Local and dispersal	253 (51.0)	14.6 (9.6)*	1.9 (2.1)	2.5 (2.5)	4.6 (3.1)**	4.1 (3.3)*
Other Closed	134 (27.0)	12.1 (8.7)*	1.5 (2.0)	2.0 (2.5)	3.8 (2.9)**	3.4 (3.0)*
Young offenders institution	67 (13.5)	17.3 (8.5)	1.8 (2.0)	2.8 (2.3)	5.5 (2.8)*	5.8 (2.9)**

Adjustments: Age, sex, ethnicity, schizophrenia, drug disorder, alcohol disorder

* $P \leq 0.05$, ** $p \leq 0.01$

3.3. Correlates with personality disorder and Axis I clinical syndromes

Correlations between criteria scores of individual DSM-IV Axis II personality disorders and PCL-R scores are demonstrated in Table 4. Total scores in the combined male and female sample were significantly correlated with adult antisocial, conduct disorder, schizoid, histrionic, and narcissistic scores. Factor 1 (interpersonal) scores were positively correlated with narcissistic, adult antisocial, and histrionic scores. The affective factor (F2) correlated positively with adult antisocial, schizoid and narcissistic scores. Lifestyle (F3) scores were significantly correlated with adult antisocial and histrionic and the antisocial factor (F4) with adult antisocial and conduct disorder scores.

Table 4. Associations between dimensional scores of Axis II Personality disorder criteria and PCL-R scores

Axis II disorder	Total	Factor 1	Factor 2	Factor 3	Factor 4
		<i>Interpersonal</i>	<i>Affective</i>	<i>Lifestyle</i>	<i>Antisocial</i>
Avoidant	0.43	-1.25	-0.01	1.89	0.43
Dependent	-0.36	-0.24	-0.45	-0.01	-0.33
Obsessive-compulsive	-1.59	0.74	-1.51	-1.29	-0.84
Paranoid	0.29	-0.23	0.53	0.75	-1.11
Schizotypal	1.17	1.68	0.22	1.35	0.80
Schizoid	3.33**	-0.49	5.62***	0.99	1.88
Histrionic	2.67**	2.04*	-0.55	2.64**	0.63
Narcissistic	2.47*	6.96***	2.22*	-0.85	-0.00
Borderline	-0.24	0.11	-1.40	0.09	0.34
Conduct disorder	4.50***	1.92	0.76	1.41	7.56***
Adult antisocial	15.0***	6.10***	9.48***	12.4***	9.86***

Adjustments: Age, sex, ethnicity, marital status before prison, drug disorder, alcohol disorder, affective/anxiety disorder (SCAN diagnosis), psychosis, intercorrelations of four factors, and comorbid PD scores (Factor 4 was not controlled for conduct disorder and adult antisocial for Factor 1, Factor 2, Factor 3). The association is presented by z-score as the partial regression coefficient over its standard error.

* $P \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 5 demonstrates that there were no significant associations between total PCL-R scores and ICD-10 clinical syndromes measured using the SCAN. Associations between anxiety and phobic disorders were confined to factor 3. An association was observed between schizophrenia and factor 1 but not total scores.

Table 5. Association between SCAN categories of Axis I Affective/anxiety disorder (SCAN diagnosis) and PCL-R scores

SCAN category	Present/ absent	Respondents N(%)	Total Mean (SD)	Factor 1	Factor 2	Factor 3	Factor 4
				<i>Interpersonal</i> Mean (SD)	<i>Affective</i> Mean (SD)	<i>Lifestyle</i> Mean (SD)	<i>Antisocial</i> Mean (SD)
Depressive disorder	No	407 (82.1)	13.2 (9.47)	1.62 (2.00)	2.35 (2.47)	4.13 (3.11)	3.78 (3.26)
	Yes	89 (17.9)	15.7 (8.99)	2.08 (2.05)	2.43 (2.33)	5.10 (3.03)	4.56 (3.24)
Anxiety disorder	No	441 (88.9)	13.3 (9.43)	1.65 (1.98)	2.32 (2.43)	4.17 (3.11)	3.92 (3.27)
	Yes	55 (11.1)	16.2 (9.03)	2.13 (2.29)	2.69 (2.55)	5.33 (2.94)*	4.64 (3.32)
Phobias	No	463 (93.3)	13.5 (9.53)	1.66 (2.01)	2.38 (2.47)	4.20 (3.13)	3.89 (3.27)
	Yes	33 (6.7)	15.7 (7.69)	2.27 (2.04)	2.06 (2.15)	5.76 (2.49)*	4.36 (3.28)
Obsessive-compulsive disorder	No	488 (98.4)	13.4 (9.37)	1.68 (2.02)	2.32 (2.42)	4.25 (3.11)	3.88 (3.27)
	Yes	8 (1.6)	23.9 (7.08)	2.88 (1.81)	5.13 (2.53)	7.38 (1.60)	6.38 (2.45)
Schizophrenia	No	458 (92.3)	13.2 (9.40)	1.60 (1.95)	2.32 (2.43)	4.20 (3.14)	3.79 (3.23)
	Yes	38 (7.7)	18.1 (8.64)	2.92 (2.41)*	2.82 (2.66)	5.50 (2.59)	5.53 (3.31)
Brain dysfunction	No	485 (97.8)	13.5 (9.42)	1.68 (2.01)	2.36 (2.46)	4.24 (3.11)	3.87 (3.25)
	Yes	11 (2.21)	20.1 (7.73)	2.73 (2.10)	2.27 (2.05)	6.82 (2.23)	6.36 (3.14)

Adjustments: Age, sex, ethnicity, psychosis, drug disorder, alcohol disorder, intercorrelations of four factors

* $P \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

We examined associations between six clinical affective and anxiety disorders derived from the self-report, CIS-R. No significant associations were found between these measures and total scores or factor scores.

3.4. Substance misuse

Associations between total PCL-R scores and disorders due to substance use are demonstrated in Table 6. All categories of substance use disorders except multiple drug use were significantly associated with lifestyle and antisocial scores. There were additional associations between opioid,

sedative, and cocaine use disorders and interpersonal, and sedative, cocaine, and solvent use disorders and affective scores.

Table 6. Association between disorders due to substance use (SCAN) and PCL-R scores

Substance	Present /absent	Respondents N(%)	Total	Factor 1	Factor 2	Factor 3	Factor 4
				<i>Interpersonal</i>	<i>Affective</i>	<i>Lifestyle</i>	<i>Antisocial</i>
			Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Opioids	No	344 (69.4)	11.34 (9.17)	1.52 (1.99)	2.11 (2.42)	3.49 (3.01)	3.11 (3.07)
	Yes	152 (30.6)	18.73 (7.90)***	2.11 (2.03)*	2.93 (2.43)	6.14 (2.49)***	5.77 (2.94)***
Cannabis	No	377 (76.0)	11.86 (9.18)	1.54 (1.98)	2.15 (2.37)	3.66 (3.01)	3.35 (3.12)
	Yes	119 (23.0)	19.14 (7.96)***	2.23 (2.04)	3.03 (2.58)	6.33 (2.53)***	5.75 (3.06)***
Sedatives/ hypnotics	No	410 (82.7)	12.46 (9.39)	1.60 (2.00)	2.22 (2.41)	3.84 (3.04)	3.58 (3.23)
	Yes	86 (17.3)	19.08 (7.52)***	2.17 (2.03)*	3.05 (2.54)*	6.49 (2.48)***	5.58 (2.95)***
Cocaine	No	375 (75.6)	11.55 (8.90)	1.43 (1.86)	2.14 (2.41)	3.60 (2.98)	3.26 (3.04)
	Yes	121 (24.4)	19.98 (8.11)***	2.55 (2.25)**	3.06 (2.45)*	6.47 (2.46)***	5.98 (3.10)***
Stimulants	No	374 (75.4)	11.74 (9.25)	1.58 (2.01)	2.14 (2.40)	3.59 (3.00)	3.29 (3.12)
	Yes	122 (24.6)	19.31 (7.53)***	2.07 (2.00)	3.03 (2.48)	6.48 (2.38)***	5.88 (2.93)***
Solvents	No	448 (90.3)	12.92 (9.34)	1.66 (2.04)	2.22 (2.41)	4.06 (3.05)	3.72 (3.24)
	Yes	48 (9.7)	19.96 (7.83)***	2.10 (1.72)	3.67 (2.45)*	6.54 (2.81)**	5.79 (2.94)*
Multiple drug use	No	445 (89.7)	12.96 (9.40)	1.65 (2.03)	2.23 (2.42)	4.07 (3.07)	3.74 (3.26)
	Yes	51 (10.3)	19.24 (7.68)**	2.16 (1.86)	3.53 (2.40)	6.29 (2.77)**	5.49 (2.90)
Alcohol	No	223 (45.0)	10.10 (8.98)	1.38 (1.79)	1.86 (2.34)	3.17 (3.11)	2.77 (3.03)
	Yes	273 (55.0)	16.47 (8.81)***	1.97 (2.15)	2.77 (2.46)	5.23 (2.80)***	4.87 (3.15)***

Adjustments: Age, sex, ethnicity, neurotic, psychosis, alcohol disorder, drug disorder (for alcohol only)

* $P \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

3.5. Criminal behavior

The age at which prisoners first appeared in court demonstrated a strong negative correlation with total PCL-R scores ($p < 0.001$). After additional adjustments for the other factor scores, age was also significantly negatively correlated with factors 1 ($p < 0.05$), 2 ($p < 0.01$), 3 ($p < 0.001$), and 4 ($p < 0.001$). Scores were also positively correlated with number of previous periods of imprisonment (total PCL-R $p < 0.001$, F1 $p < 0.01$, F2 $p < 0.01$, F3 $p < 0.001$, F4 $p < 0.001$). However, few significant associations emerged between PCL-R scores and individual categories of offending behavior leading to current imprisonment.

Total PCL-R scores were significantly associated only with offences of theft ($p < 0.05$) and (negatively) with drug offences ($p < 0.01$). There were no independent associations between factor 1 and any category of offending behavior. Factor 2 was significantly associated with minor offences of violence ($p < 0.05$), theft ($p < 0.05$), and criminal damage ($p < 0.01$). Factor 3 was independently associated only with theft ($p < 0.05$), and Factor 4 with robbery ($p < 0.05$). There were negative associations between factors 1 ($p < 0.01$), 2 ($p < 0.05$), 3 ($p < 0.01$), and 4 ($p < 0.001$) and drug offences.

3.6. Behavioral patterns in prison and the community

There were associations between living off crime prior to imprisonment and total PCL-R ($p < 0.01$), factor 2 ($p < 0.05$), factor 3 ($p < 0.01$), and factor 4 ($p < 0.01$), but not factor 1 scores. There were no significant associations observed with reports of having been the victim of violence in the family home, sexual abuse, financial problems, or having been admitted to a psychiatric hospital and total or individual factor scores. However, total and individual factor scores were significantly ($p < 0.01$) associated with periods of homelessness. There was also an association between reports of attempted suicide and factor 3 (lifestyle) ($p < 0.05$), but not with total or other factor scores.

In prison, PCL-R scores were associated with receiving additional punishments as indicated by significant associations between being placed in solitary confinement (total $p < 0.001$, F1 $p < 0.05$, F2 $p < 0.01$, F3 $p < 0.001$, F4 $p < 0.001$) and receiving added days to sentences (total $p < 0.01$, F1 NS, F2 $p < 0.05$, F3 $p < 0.05$, F4 $p < 0.01$). There were no associations between PCL-R scores and reports of being physically assaulted by other prisoners, having belongings stolen, or physical intimidation to hand over belongings. There was an association between factor 4 (antisocial) scores and reports of being threatened with violence ($p < 0.01$), but no associations between this experience and other factor scores. Total scores ($p < 0.01$), and factors 1 ($p < 0.05$), 2 ($p < 0.05$), 3 ($p < 0.05$), and 4 ($p < 0.01$) were associated with reports of receiving unwanted sexual attentions from other prisoners. There were no significant associations with reporting being forced to have sex.

4. Discussion

4.1. Prevalence of Psychopathy among prisoners

Mean PCL-R scores of men in this survey were lower than the large pooled experimental samples of North American male prison inmates ($M = 22.1$) described by Hare (2003), and substantively lower than those for females ($M = 19.0$). They were similar, however, to a pooled UK male sample ($M = 16.1$; Cooke et al, 2005). Nevertheless, only one of these UK pooled samples was representative of an entire correctional jurisdiction, and the North American samples were more likely to come from high and medium security institutions. Cooke and Michie (1999) argued that sample selection did not explain the lower prevalence of psychopathy among Scottish prisoners. They recommended an adjusted PCL-R cut score of 25 to receive the diagnosis, but more recently made a further adjustment of approximately two points (28; Cooke et al, 2005). However, Bolt et al (2007) concluded that an adjustment of only half a point is justified. Nevertheless, the findings of this study indicate an even greater discrepancy between England/Wales and Scotland than between England/Wales and North America. In the only comparable survey of an entire correctional

jurisdiction, Cooke (1994) found the prevalence of psychopathy at a cut-off of 30 among Scottish sentenced men to be only half that of equivalent prisoners in England and Wales. Cooke and Michie (1999) subsequently argued that Scottish prisoners required higher levels of the underlying trait before certain characteristics become apparent compared to North American prisoners and forensic patients, together with the possibility that Scottish psychopaths were more likely to migrate. This last point received only partial support from a comparison between Scottish and English-born prisoners using data obtained in the first stage of our survey. Prisoners born in Scotland scored significantly higher on adult antisocial behavior, had more previous imprisonments, and were significantly more criminally versatile. However, age at first conviction, and scores on Axis II personality disorders found to correlate with total PCL-R and factor scores in this study, demonstrated no significant differences. This suggested that if migration was a factor among Scottish-born individuals in English prisons, it was secondary to their extensive criminal lifestyle rather than their personalities.

4.2. Distribution of psychopathic traits among prisoners

The continuous distribution of psychopathic traits in the male prison population of England and Wales was similar to that observed in pooled, male experimental samples from North America, but very different for women prisoners (Hare, 2003) and differed from that of men and women in the household population of Britain (Coid et al, submitted). This suggested either that North American female samples were more highly selected and atypical, or that the criminal justice process leading to imprisonment in Canada and the USA is more selective of women with psychopathic traits. The latter is unlikely and representativeness of this female prison sample from England and Wales, including subcategories of non-UK born women illegally importing drugs, and those serving sentences in open prisons, together with the high prevalence of women with severe mental disorder (Singleton et al, 1998), may have determined the distribution of psychopathy scores, similar to the half-normal distribution observed in the general population (Coid et al, submitted).

Within the prison population of England and Wales, psychopathic prisoners are more likely to have extreme features along a spectrum, including younger age, early onset of criminal behavior, prolific offending, repeated imprisonment, living off crime in the community, and periods of homelessness. Although prisoners with psychopathic traits were found among most categories of offending behavior, including serious offences, we found that they are more likely to be in prison for common, petty crimes. This differs from the impression conveyed by experimental samples selected from high security settings for study of the association between psychopathy and violence. However, they were less likely to be found in low security settings, such as open prisons in England and Wales, due to behavioral problems in prison.

Previously observed associations between assault and robbery offences (Hart & Hare, 1997) were partly confirmed by specific associations with individual factors, together with disruptive behavior in prison, reflected in punishments of solitary confinement and addition of days to sentences. Although prisoners with high levels of psychopathic traits were more likely to report receiving threats of violence and unwanted sexual attentions, they did not report being physically victimized, in contrast to prisoners with affective, anxiety, and psychotic disorders (Coid et al, 2002). Threatening behavior and sexual overtures may have resulted from their own behavior, and where psychopathy is more typically associated with intimidation, victimization, and aggressive homosexual behavior towards other prisoners (Coid, 1998).

4.3. Demography, intelligence and the 4-factor model

Differential correlations with a series of measures highlight the multidimensional nature of the construct of psychopathy and suggest the likelihood of multiple etiological determinants. However, the selected nature of prison populations means that firm conclusions cannot be drawn regarding the apparent decline in psychopathy with age in the general population. Nevertheless, we did not

observe a decline in facet 1 in the household survey (Coid et al, submitted), similar to our observations among prisoners. Older prisoners included more serving life sentences, including domestic homicides, and more sex offenders against children. However, our findings are in accordance with previous studies investigating the effects of ageing on psychopathy scores using a cross-sectional design. In a study of Harpur and Hare (1994), it was demonstrated that the traditional factor 2 of the PCL-R (social deviance) declined with age, whereas the “psychopathic traits” including the interpersonal style and affective deficiency (factor 1) remained stable across various age groups. This was confirmed by Ullrich et al (2003) who applied the three-factor model of psychopathy in a sample of German prisoners and found an age related decline only for factor 3 (impulsivity). These findings were not unexpected against the background of the assumption of “psychopathic traits” (interpersonal and affective) representing the core personality traits (which are supposed to demonstrate stability), whereas traits constituting “social deviance” (impulsiveness and antisocial) are more strongly behavior-related.

Non-UK born prisoners showed no increased tendency to psychopathy, perhaps because a proportion had become involved in illegal importation of drugs for economic reasons rather than as part of a criminal lifestyle. Associations between interpersonal and lifestyle factors and black ethnicity were of interest and correlated with certain differences in specific Axis-II personality disorder categories between white and black prisoners previously observed (Coid et al, 2002). In general, psychopathic traits did not show strong associations with social class, although interpersonal factor 1 scores were significantly higher among prisoners of higher social class. Finally, there was no association between psychopathy and being a remanded prisoner after adjusting for age.

Low intelligence is an important predictor of offending in the general population (Farrington, 1997), corresponding to our finding of associations between low verbal intelligence and an

antisocial and impulsive/irresponsible lifestyle, but not with the interpersonal or affective factors.

Previous research in an adolescent forensic sample demonstrated a positive association between verbal intelligence and factor 1, and an inverse correlation with factor 2 (Salekin, Neumann, Leistico & Zalot, 2004). Similarly, a positive correlation with verbal intelligence was found with factor 1 and an inverse correlation with affective (factor 2) and lifestyle items (factor 3) in a study of psychiatric patients (Vitacco et al, 2005).

4.4. Correlates with personality disorder and clinical syndromes

Consistent with research on the factor structure of the PCL-R (Hare, 2003; Neumann et al, 2005), we found that the four factors are highly inter-correlated. We used partial correlations to adjust for potential confounding which revealed their independent associations. We therefore found fewer associations with Axis II personality scores than in previous forensic samples (Hare, 2003; Hart, Cox & Hare, 1995). However, our findings were generally similar, in that adult antisocial disorder, conduct disorder, narcissistic and histrionic scores derived from diagnostic instruments correlated most strongly with psychopathy (Hare, 2003; Hart *et al*, 1995). Schizoid personality disorder was also associated. The glibness and superficial charm characterizing factor 1 was, as expected, strongly associated with narcissistic and histrionic personality disorder. The finding of an association between factor 2 and schizoid personality disorder would be explained by affective dysfunction characterizing this factor. Impulsive and irresponsible lifestyle characteristics of factor 3 correlated with histrionic personality disorder in this prison sample. Conduct disorder was associated only with factor 4 and total scores, suggesting the importance of an early onset of behavioral disturbance correlating with the antisocial factor.

In this sample, all factors were highly correlated with antisocial behavior in adulthood as measured by antisocial personality disorder scores after age 15. However, lack of a correlation with borderline personality disorder was unexpected, particularly as it had previously been found in the British

household population (Coid et al, submitted). Among prisoners, this association was confounded by adult antisocial behavior.

According to Cleckley's (1941) original observations, psychopathic individuals show neither psychoneurotic nor psychotic symptoms. Our findings only partly support this. There were relatively weak associations observed between schizophrenia and factor 1, and between phobic and anxiety disorders and factor 3. In contrast to a household survey using the CIS-R (Coid et al, submitted), no associations were found with obsessive-compulsive disorder. This suggests that at lower levels of psychopathic traits there may be weak associations with OCD at the general population level, but among populations with higher trait levels and more individuals with psychopathy, these associations are absent.

On the other hand, the observation of an association between anxiety and phobic disorders is of some interest. The relationship with psychopathy has been controversial. It is probable that the associations we found were robust because the overall prevalence of all anxiety disorders in this prison sample was very high (Singleton et al 1998), imprisonment, and especially remand, being a highly stressful situational experience for most prisoners. It has been argued that low anxiousness should itself be included as a criterion for psychopathy. But also that there should be a distinction between "primary" (with low anxiety) and "secondary" (with high anxiety) psychopaths (see Widiger, 2006). It may also be important to distinguish between fearfulness and anxiousness. Persons high in fearlessness engage in substantial risk taking, but then may experience anxiety in relation to their producing and encountering highly stressful events (Frick, Lilienfeld, Ellis, Loney & Silverthorn 1999, Lilienfeld 1994). However, it is not clear whether thrill-seeking behavior is best understood as reflecting fearlessness, as an impulsive disposition, or both. The association with anxiety and phobic disorders with factor 3 in this study suggests that this may be associated through impulsiveness.

All previous studies examining substance misuse and psychopathy have demonstrated associations (Schubert, Wolf, Patterson, Grande & Pendleton 1988; Hare, 2003). Psychopathic individuals in forensic samples are also relatively more likely to have problems due to alcohol misuse than other offenders, but in the British household population the association was weak (Coid et al, submitted).

Few specific associations were found between substance misuse and either factors 1 or 2, suggesting that effects of these factors on choice of substances was weak. Overwhelmingly, substance misuse was part of an antisocial and irresponsible lifestyle.

4.5. Methodological limitations

Although this sample was representative of the prison population of England and Wales, it is important to consider the highly selected nature of any prison population when examining correlates of psychopathy; most prisoners in any country are young, male, of low social class or previously unemployed. A disproportionate number in the UK are black (Coid et al, 2002), and characterized by very high levels of psychiatric morbidity (Singleton et al, 1998). These factors must be taken into account when comparing findings with those in the general population (Coid et al., submitted) and in making comparisons with findings from studies using experimental samples, often selected from unrepresentative prison locations deliberately chosen in anticipation that there will be a raised prevalence of psychopathic individuals for study.

The sampling frame ensured that the survey was highly representative and attrition rate at both stages was low. Few prisoners refused to participate, attrition being largely accounted for by rapid movement of some prisoners between institutions or unexpected release. However, this study examined correlates with psychopathic traits in the prison population and not with psychopathy as categorically defined. Furthermore, collateral information on previous behavior was relatively

limited and previous psychological and psychiatric reports were rarely available to interviewers. This may have biased PCL-R scores so that the true prevalence was higher than we have recorded. The clinically trained raters had information about previous criminal behavior, together with measures from the first stage of the survey. However, PCL-R ratings were taken in the context of an interview that gave primacy to the diagnosis of ICD-10 clinical syndromes. In the context of recommendations for administration of the instrument (Hare, 2003), they must be considered limited.

5. Summary and Conclusion

Our study demonstrated that the prevalence of psychopathy is remarkably higher in male than in female prisoners. The same held true for observations of dimensional scores of the interpersonal, affective, impulsive and antisocial components. Although the prevalences and scores are higher than in a representative non-forensic and non-psychiatric community sample, the pattern of gender differences was identical (Coid et al., submitted). These findings suggest that psychopathy measured with the PCL-R and PCL: SV does not reflect a different construct depending on the population under study but a more severe condition among individuals detained in prison.

The differentiation of psychopathy into its sub-components revealed important associations about the differential associations of the interpersonal, affective, lifestyle and antisocial factors and various outcome measures. Every factor demonstrated a specific pattern of relationship with comorbid psychopathology and social and behavioral problems relevant for a better understanding of the construct.

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